

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-537

Relating to Exemptions Under Section 27156  
of the California Vehicle Code

Group-A Autosports  
Skunk2 Racing VTEC Camshaft

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Section 39515 and Section 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the installation of the Skunk2 Racing VTEC Camshaft, produced and marketed by Group-A Autosports, 25710 Industrial Blvd. # 2, Hayward, California 94545, has been found not to reduce the effectiveness of the applicable vehicle pollution control systems and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for the Acura and Honda vehicles listed in Exhibit A.

The Skunk2 Racing VTEC Camshaft is manufactured with different opening crankshaft angles, duration, and lift of intake and exhaust valves from those of the stock camshaft in order to allow the engine to produce more power. The manufacturer, Group-A Autosports, recommends an ignition timing setting of 16-17 degrees before top dead center.

This Executive Order is valid provided that the installation instructions for the Skunk2 Racing VTEC Camshaft will not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer, besides the ignition timing setting mentioned above.

Changes made to the design or operating conditions of the Skunk2 Racing VTEC Camshaft, as exempt by the Air Resources Board, which adversely affect the performance of the vehicle's pollution control system shall invalidate this Executive Order.

This Executive Order shall not apply to any Skunk2 Racing VTEC Camshaft advertised, offered for sale, sold with, or installed on a new motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

Marketing of the Skunk2 Racing VTEC Camshaft using any identification other than that shown in this Executive Order or marketing of the Skunk2 Racing VTEC Camshaft for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

This Executive Order does not constitute any opinion as to the effect the use of the Skunk2 Racing VTEC Camshaft may have on any warranty either expressed or implied by the vehicle manufacturer.

This Executive Order is granted based on emission test results in the modified configuration using the Cold-Start CVS-75 Federal Test Procedure and an examination of the On-Board Diagnostic II (OBD II) system. A 2000 Honda Civic Si with a 1.6 liter engine (YHNXV01.6VA2, TLEV, PC) was used for the evaluation of the Skunk2 Racing VTEC Camshaft. Results from emissions testing conducted at Clean Air Vehicle Technology Center are shown below (in grams per mile):

50k	NMOG	CO	NOx	HCHO
Emission Level	0.081	1.618	0.118	0.0023
(w. DF applied)				
STD	0.125	3.4	0.4	0.015
100k	NMOG	CO	NOx	HCHO
Emission Level	0.087	1.662	0.131	0.0027
(w. DF applied)				
STD	0.156	4.2	0.6	0.018

The emission test results in the modified configuration were below the applicable certification standards. Examination of the OBD II system showed the Skunk2 Racing VTEC Camshaft does not affect OBD II operation. Therefore, based on the test results, the staff concludes that the Skunk2 Racing VTEC Camshaft meets the criteria for exempting general criteria parts.

However, the ARB finds that reasonable grounds exist to believe that use of the Skunk2 Racing VTEC Camshaft may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the CVS-75 Federal Test Procedure. Accordingly, the ARB reserves the right to conduct additional emission tests, in the future, as such tests are developed, that will more adequately measure emissions from all cycle phases. If such test results demonstrate that the Skunk2 Racing VTEC Camshaft adversely affect emissions during off-cycle conditions (defined as those conditions which are beyond the parameters of the Cold-Start CVS-75 Federal Test Procedure), this Executive Order shall be effectively rescinded as of the date the test results are validated. Further, if such test results or other evidence provides the ARB with reason to suspect that the Skunk2 Racing VTEC Camshaft will affect the durability of emission control systems, Group-A Autosports shall be required to submit durability data to show that the durability of vehicle emission control systems are not, in fact, affected and/or that the add-on or modified part demonstrates adequate durability.

The ARB reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of Title 13, California Code of Regulations, Section 2222, et seq.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF GROUP-A AUTOSPORTS' SKUNK2 RACING VTEC CAMSHAFT.

No claim of any kind, such as "Approved by the Air Resources Board", may be made with respect to the action taken herein in any advertising or other oral or written communication.

Violation of any of the above conditions shall be grounds for revocation of this order. The order may be revoked only after a ten-day written notice of intention to revoke the order, in which period the holder of the order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request and the order may not be revoked until a determination is made after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 21<sup>ST</sup> day of February, 2002.



Allen Lyons, Chief

New Vehicle/Engine Programs Branch

## EXHIBIT A

YEAR	MAKE	MODEL	PART #
1992-1993	ACURA	INTEGRA GSR	305-05-0140
1994-2001	ACURA	INTEGRA GSR	305-05-0140
1997-1998	ACURA	INTEGRA TYPE-R	305-05-0140
2000-2001	ACURA	INTEGRA TYPE-R	305-05-0140
1994-1997	HONDA	DEL SOL S	305-05-0140
1999-2000	HONDA	CIVIC Si	305-05-0140

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1994-2001	ACURA	INTEGRA GSR	305-05-0140
1997-1998	ACURA	INTEGRA TYPE-R	305-05-0140
2000-2001	ACURA	INTEGRA TYPE-R	305-05-0140
1994-1997	HONDA	DEL SOL S	305-05-0140
1999-2000	HONDA	CIVIC Si	305-05-0140

## EVALUATION SUMMARY

Manufacturer Name: Group-A Autosports

Name of Device: Skunk2 Racing VTEC Camshaft

Background:

Group-A Autosports of 25710 Industrial Blvd. # 2, Hayward, California 94545, has applied for an exemption from the prohibitions in Section 27156 of the California Vehicle Code (VC) for the Skunk2 Racing VTEC Camshaft designed for the Acura and Honda vehicles listed in Exhibit A.

Recommendation:

Grant exemption to Group-A Autosports as requested, and issue Executive Order D-537.

Device Description:

Group-A Autosports' Skunk2 Racing VTEC Camshaft is specifically designed for installation on the Acura and Honda vehicles listed in Exhibit A. The installation of the system does not require any major modifications to the stock motor. Group-A Autosports recommends an ignition timing setting of 16-17 degrees before top dead center which is a smaller range than recommended by the Original Equipment Manufacturer, but within the range of stock settings.

The Skunk2 Racing VTEC Camshaft is intended to increase the vehicle's power output. The induction flow into and exhaust from the engine is increased because the Skunk2 Racing VTEC Camshaft is manufactured with different opening crankshaft angles, duration, and lift of intake and exhaust valves than the stock camshaft. This allows better induction of the intake charge into the engine, resulting in a higher power output. However, the aggressive intake charge induction can have an adverse effect on emissions if the scavenging of the exhaust gases causes excessive portions of the intake charge to be drawn from the combustion chamber before combustion. Also, potential fuel economy penalties could be experienced.

Discussion/Basis for the Recommendation:

The scavenging effect on the intake charge can manifest in substantial emissions increases in HC and CO. Group-A Autosports was required to conduct emission testing of the Skunk2 Racing VTEC Camshaft to show compliance with the applicable certification standards. A 2000 Honda Civic Si with a 1.6 liter engine (YHNXV01.6VA2) was used for the evaluation of the Skunk2 Racing VTEC Camshaft. The test vehicle was certified to passenger car Transitional Low-Emission Vehicle standards and was equipped with On-Board Diagnostic II system. Testing consisted of one Cold-Start CVS-75 FTP in the modified configuration to set all readiness codes, and measure emissions. The ARB did not perform testing to confirm the test results submitted by the applicant.

Results from emissions testing conducted at Clean Air Vehicle Technology Center, in Hayward, California, are shown below (in grams per mile):

50k	NMOG	CO	NOx	HCHO
Emission Level	0.081	1.618	0.118	0.0023
(w. DF applied)				
STD	0.125	3.4	0.4	0.015
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Emission Level	0.087	1.662	0.131	0.0027
(w. DF applied)				
STD	0.156	4.2	0.6	0.018

The emission test results in the modified configuration were below the applicable certification standards. All OBD II system readiness indicators set in the modified configuration, and no diagnostic trouble codes were triggered. Therefore, based on the test results, the staff concludes that the Skunk2 Racing VTEC Camshaft meets the criteria for the exemption of general criteria parts. However, the ARB finds that reasonable grounds exist to believe that use of the Skunk2 Racing VTEC Camshaft may adversely affect emissions of motor vehicles when operating under conditions outside the parameters of the previously prescribed test procedure. Accordingly, the ARB reserves the right to conduct additional emission tests in the future, as such tests are developed.

Based on the CVS-75 FTP and OBD-II test results, the staff concludes that the Group-A Autosports' Skunk2 Racing VTEC Camshaft meets the requirements for a VC 27156 exemption for the Acura and Honda vehicles listed in Exhibit A.

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1992-1993	ACURA	INTEGRA GSR	305-05-0140
1994-2001	ACURA	INTEGRA GSR	305-05-0140
1997-1998	ACURA	INTEGRA TYPE-R	305-05-0140
2000-2001	ACURA	INTEGRA TYPE-R	305-05-0140
1994-1997	HONDA	DEL SOL S	305-05-0140
1999-2000	HONDA	CIVIC Si	305-05-0140